CLAIMS

1. Method of determining the transmission power of transmitted pilot symbols, by replacing useful signals, in a transmission frame of a multicarrier transmission system with spreading of the signal in the frequency domain by spreading sequences of the OFDM-CDMA, MC-CDMA, MC-CDM or MC-SS-MA type, the said pilot symbols being used for estimating the channel coefficients, characterised in that it includes the following steps:

a) determining a performance level to be achieved by the transmission,

b) deducing, from the said performance level to be achieved, the signal to noise ratio level introduced by the channel,

c) deducing from the signal to noise ratio level on the one hand the transmission power of the said pilot symbols or a single spreading code allocated and on the other hand the increase in power which it is necessary to give to the said pilot symbols for the following allocated spreading codes, and

d) determining, at each of the predetermined times, according to the number of spreading codes used at this time, the transmission power of the said pilot symbols by means of the following equation:

$$Q = \alpha(K-1) + Q_0 \quad ; \; K \geq 1 \; , \alpha > 0 \text{ and } Q_0 > \alpha \qquad (8)$$

2. Method of determining the transmission power of pilot symbols according to Claim 1, characterised in that, in order to determine the said signal to noise ratio level introduced by the channel, it includes the following steps:

a) deducing, from the said performance level to be achieved, the signal to noise ratio level introduced by the corresponding channel for a channel estimation deemed to be perfect, and

b) increasing the said signal to noise ratio level thus deduced by a predetermined quantity which it is possible to tolerate in order to compensate for the degradations in the performance level resulting from an imperfect channel estimation.

3. Method of determining the transmission power of pilot symbols according to Claim 1 or 2, characterised in that the transmission power of the pilot symbols for a single spreading code allocated and the increase in power which it is necessary to give

to the said pilot symbols for the following allocated spreading codes are determined so as to keep the performance level to be achieved identical to that which would be achieved in the case of perfect estimation.

4. Method of determining the transmission power of pilot symbols according to one of the preceding claims, characterised in that the transmission power of the said pilot symbols for a single allocated spreading code and the increase in power which it is necessary to give to the said pilot symbols for the following allocated spreading codes are determined by means of the following equations:

$$\alpha = \frac{1}{\gamma\lambda} \quad \text{and} \qquad (19)$$

$$Q_0 = \frac{N\sigma_0^2 + 1}{\gamma\lambda(\lambda - 1)} + \frac{1}{\gamma\lambda}$$

where N is the number of carriers used in the said MC-CDMA transmission system, γ is the smoothing gain used in the detection process, λ is a factor representing the increase in signal to noise ratio of the channel which it is possible to tolerate, σ_0^2 the variance of the total interference taking into account on the one hand the noise introduced by the channel for a channel estimation deemed to be perfect and on the other hand the channel estimation error.